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Egerton

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[54] **RAILROAD COUPLER MOUNT**

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[73] Assignee: **Pulse Electronics, Inc.**, Rockville, Md.

[21] Appl. No.: **772,480**

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[51] **Int. Cl.**[5] **G01L 5/28**

[52] **U.S. Cl.** **73/129**

[58] **Field of Search** ..... 73/129, 865.9; 246/167 R, 169 R; 213/75 R-79, 98, 99, 1 R, 100 R; 248/231.4, 53, 227, 231.9, 225.31

[56] **References Cited**

U.S. PATENT DOCUMENTS

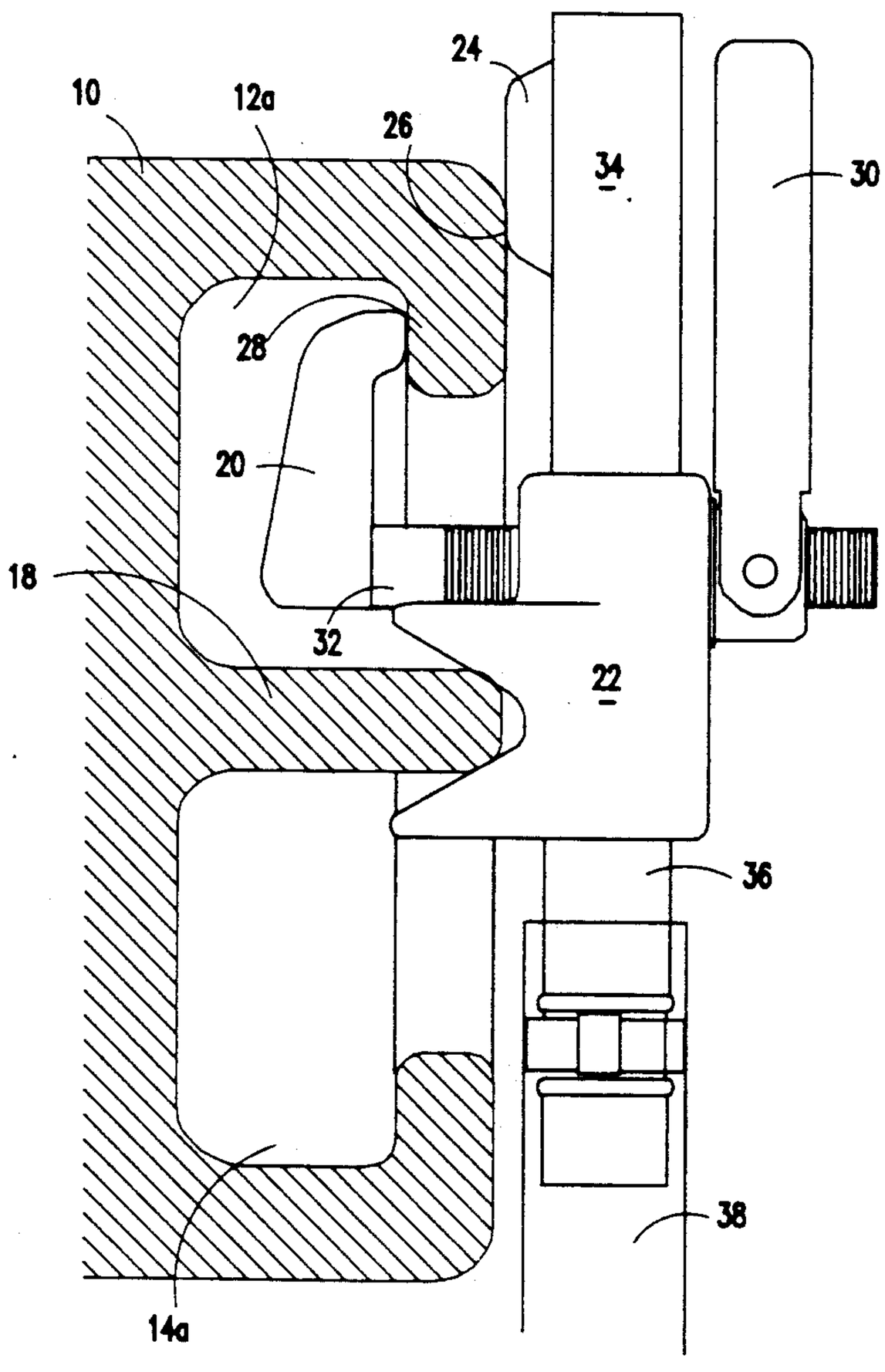
2,355,544	8/1944	McGowan .	
4,487,060	12/1984	Pomeroy .	
4,520,662	6/1985	Schmid .	
4,592,217	6/1986	Fernandez et al. .	
4,691,563	9/1987	Martin .	
4,747,302	5/1988	Goss	73/129
4,876,885	10/1989	Martin et al. .	
5,131,269	7/1992	Blosnick et al.	248/53

Primary Examiner—Robert Raevis
Attorney, Agent, or Firm—Whitham & Marhoefer

[57] **ABSTRACT**

A railroad coupler mount includes a hook (**20**) for contacting the inside upper lip (**28**) of a coupler head (**10**) within a single coring hole (**12***a*), a jaw member (**22**) which engages the rib (**18**) between a pair of coring holes (**12***a* and **14***a*), a pad (**24**) for abutting against an outside surface (**26**) of the coupler head (**10**), and a handle (**30**) for orienting the hook (**20**) in the transverse or upright positions. In a preferred configuration, end-of-train signalling and monitoring equipment (**42**) is connected to a railroad coupler mount (**44**) and the handle (**64**) which tightens the hook (**58**) against the inside lip of the coupler head also serves the function of locking a battery compartment door (**54**) closed.

6 Claims, 6 Drawing Sheets



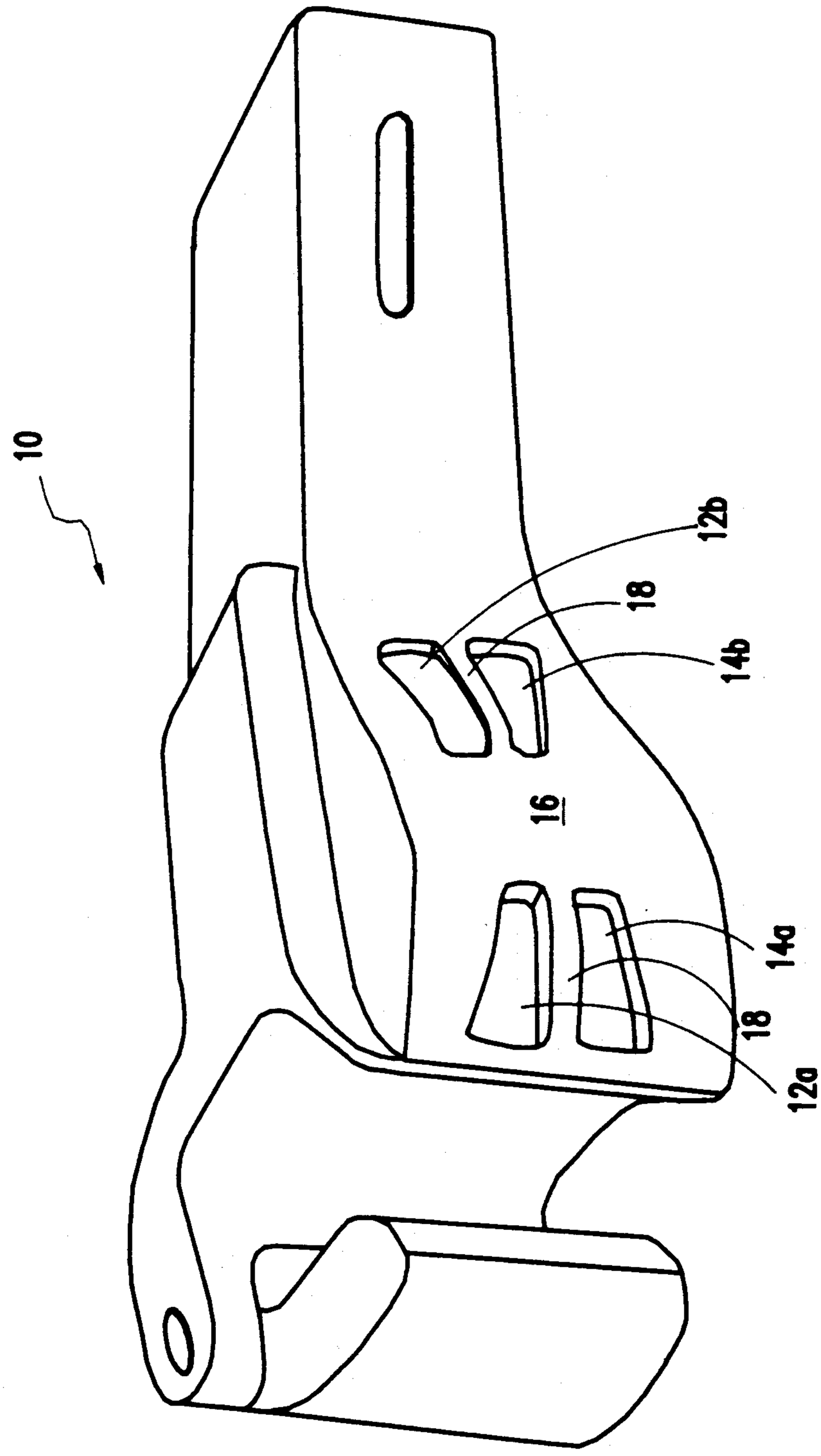


FIG. 1
PRIOR ART

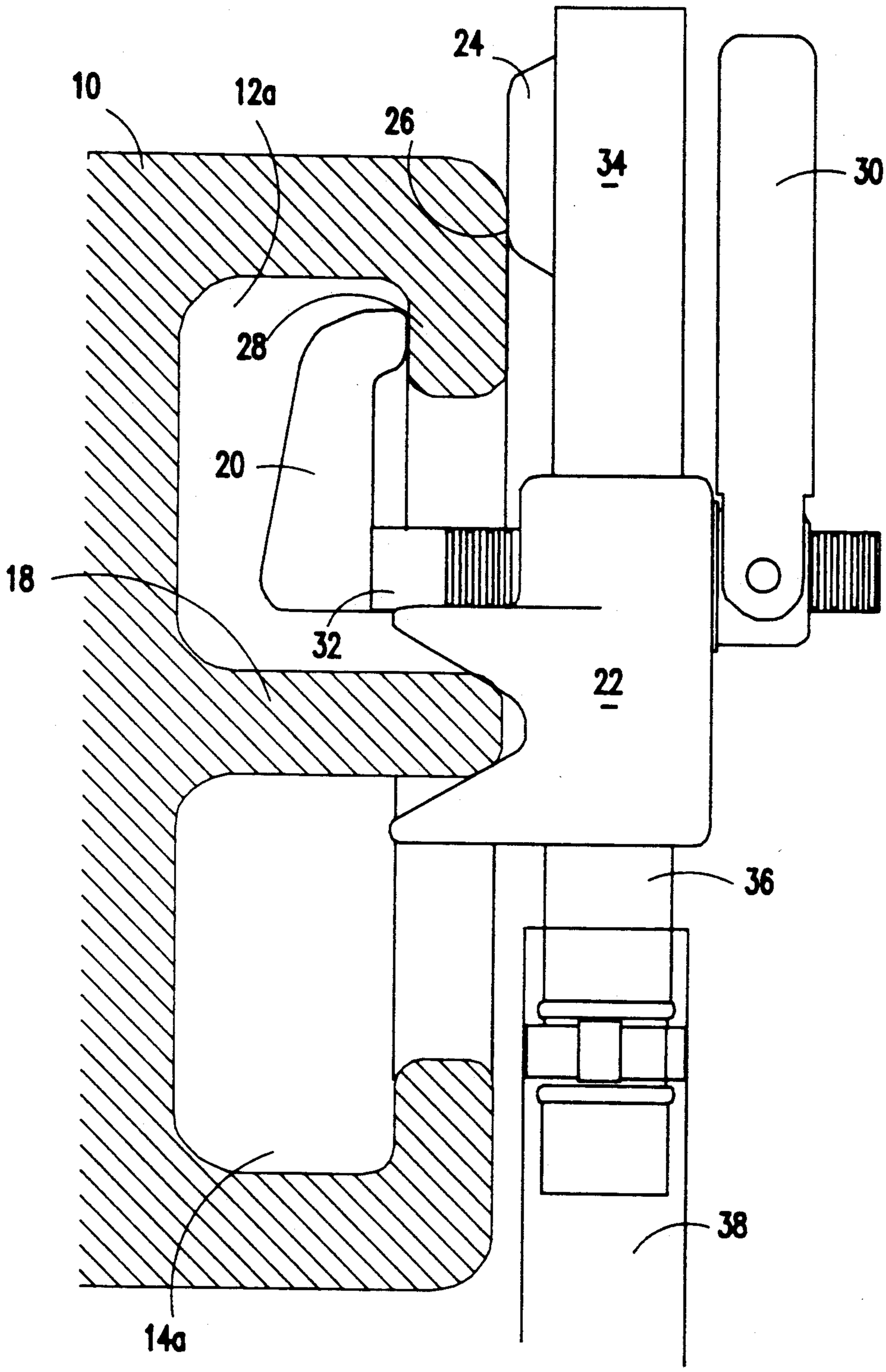


FIG.2

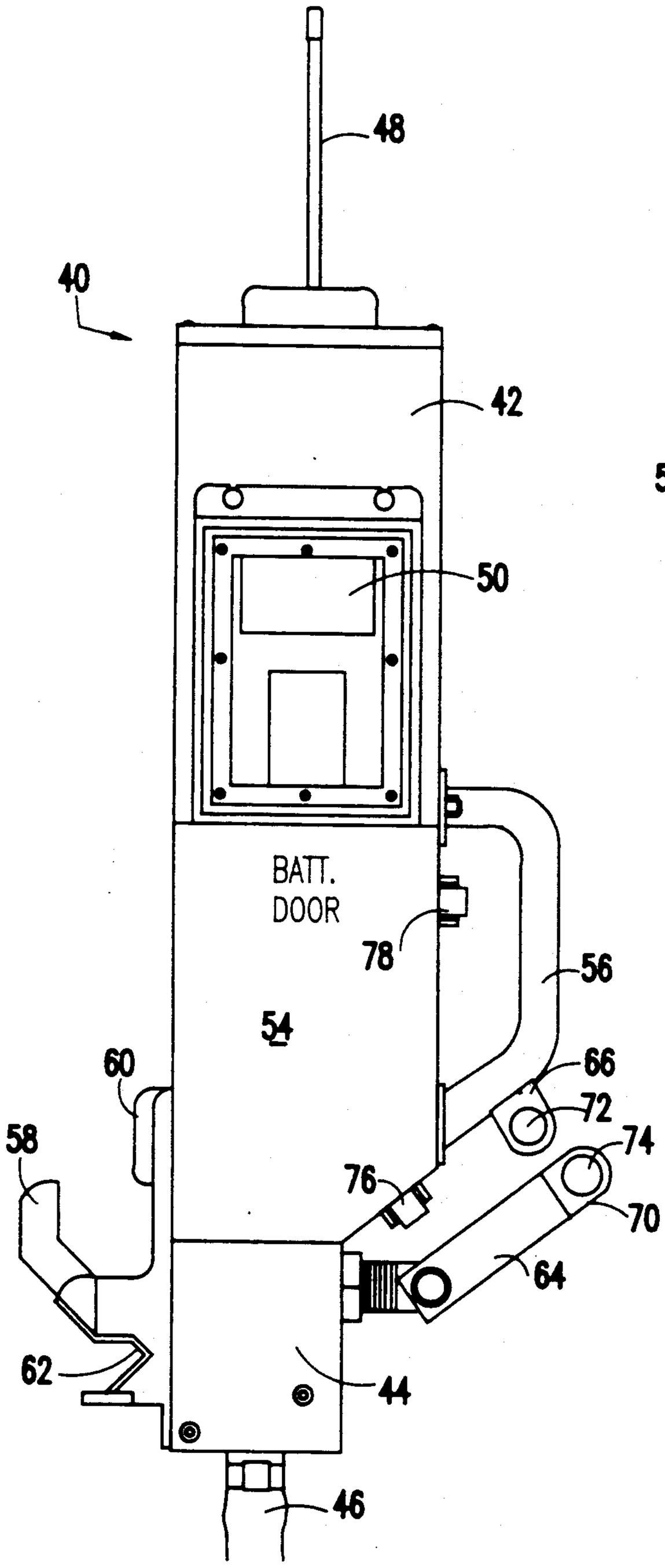

48
40
42
50
BATT.
DOOR
78
56
54
60
66
72
74
58
76
70
64
62
44
46

FIG.3

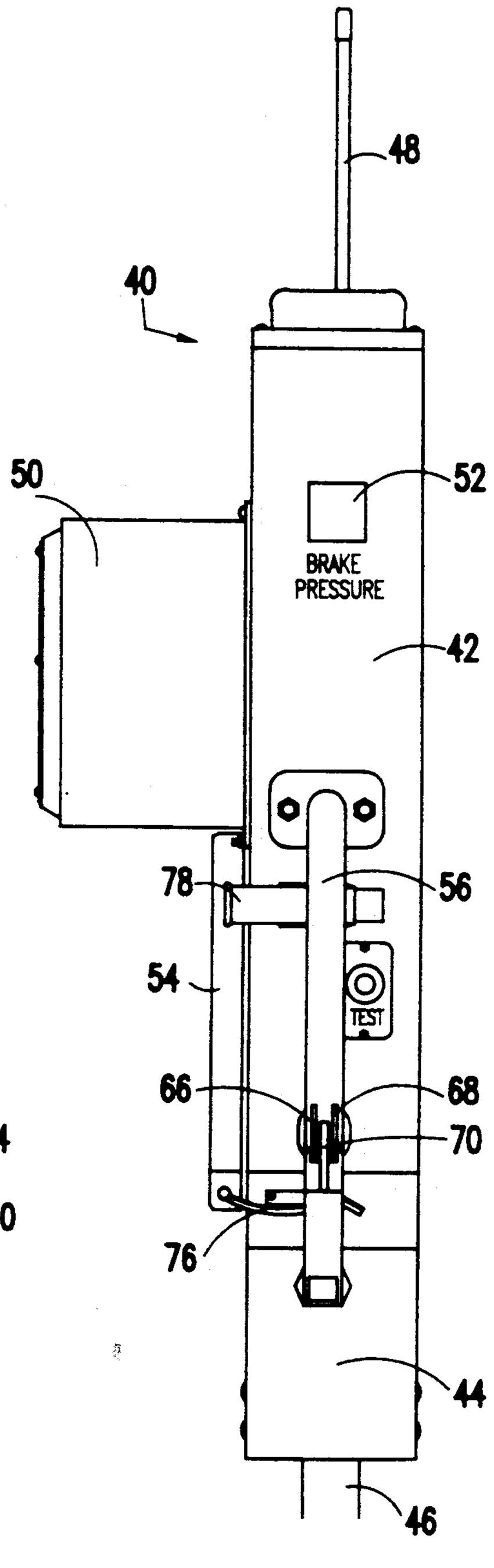

48
40
50
52
BRAKE
PRESSURE
42
78
56
54
TEST
66
68
70
76
44
46

FIG.4

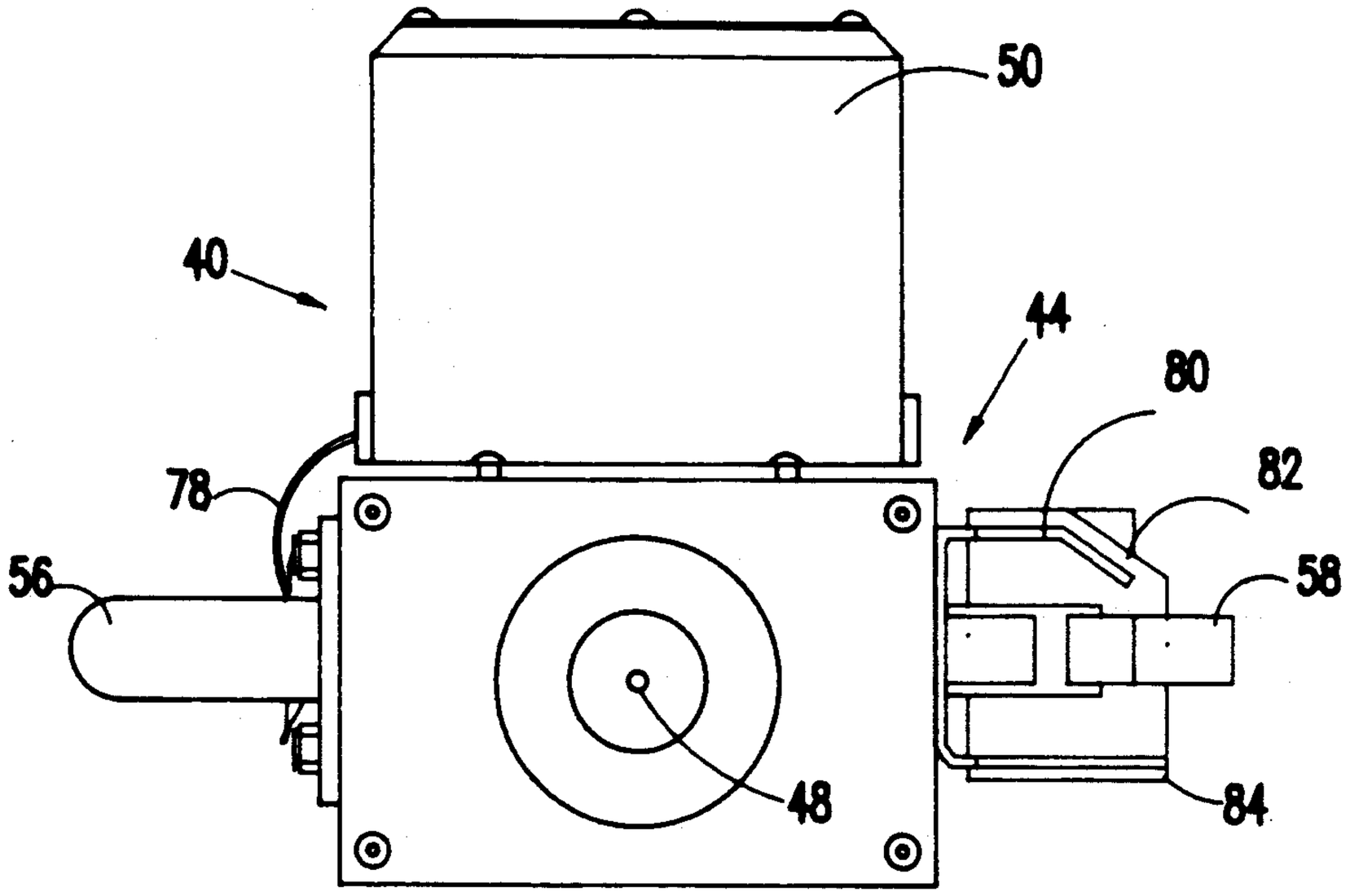

50
40
44
80
82
78
58
56
48
84

FIG.5

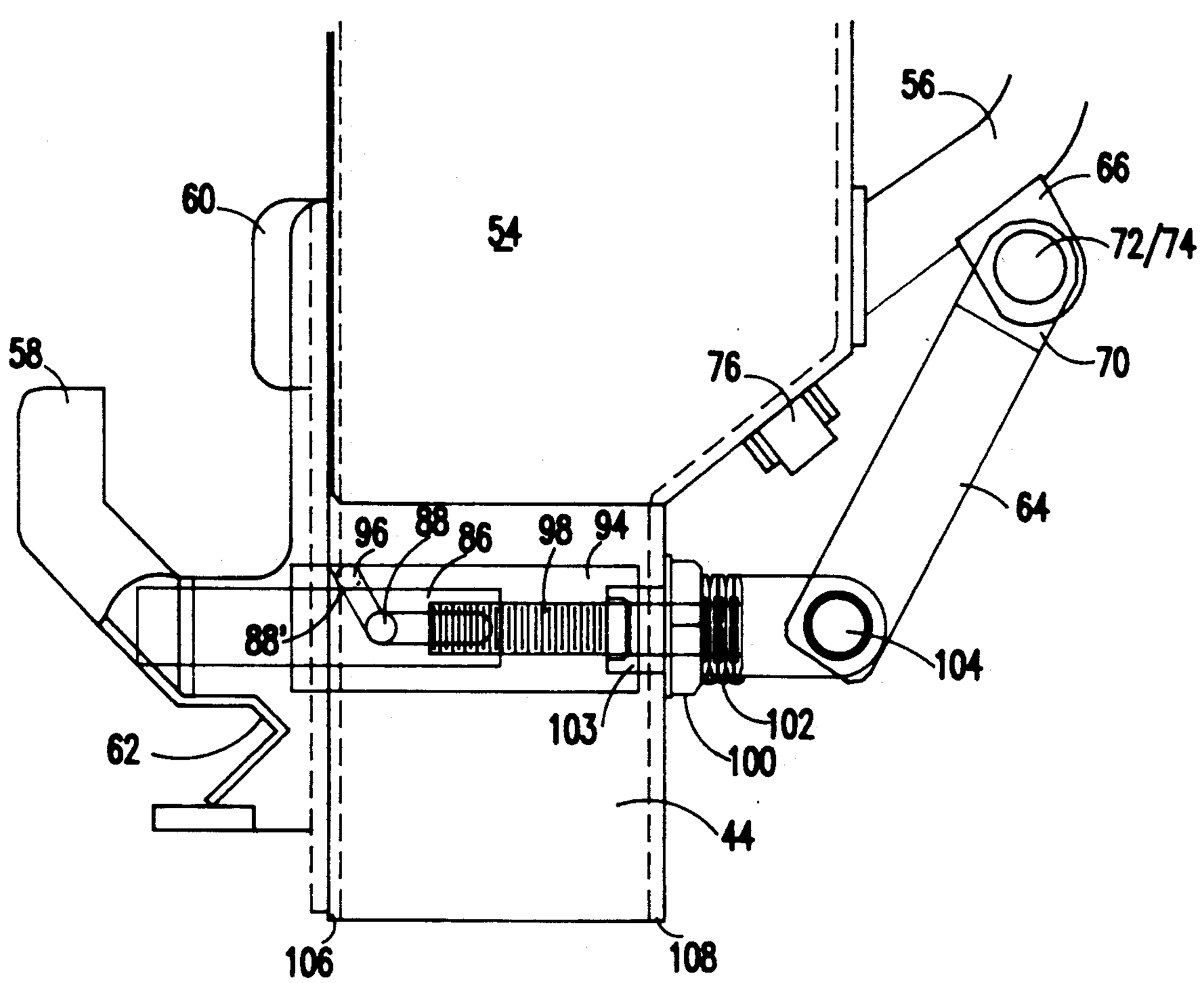

56
66
60
54
72/74
58
70
76
64
96
88
86
98
94
88'
104
103
102
100
62
44
106
108

FIG.8

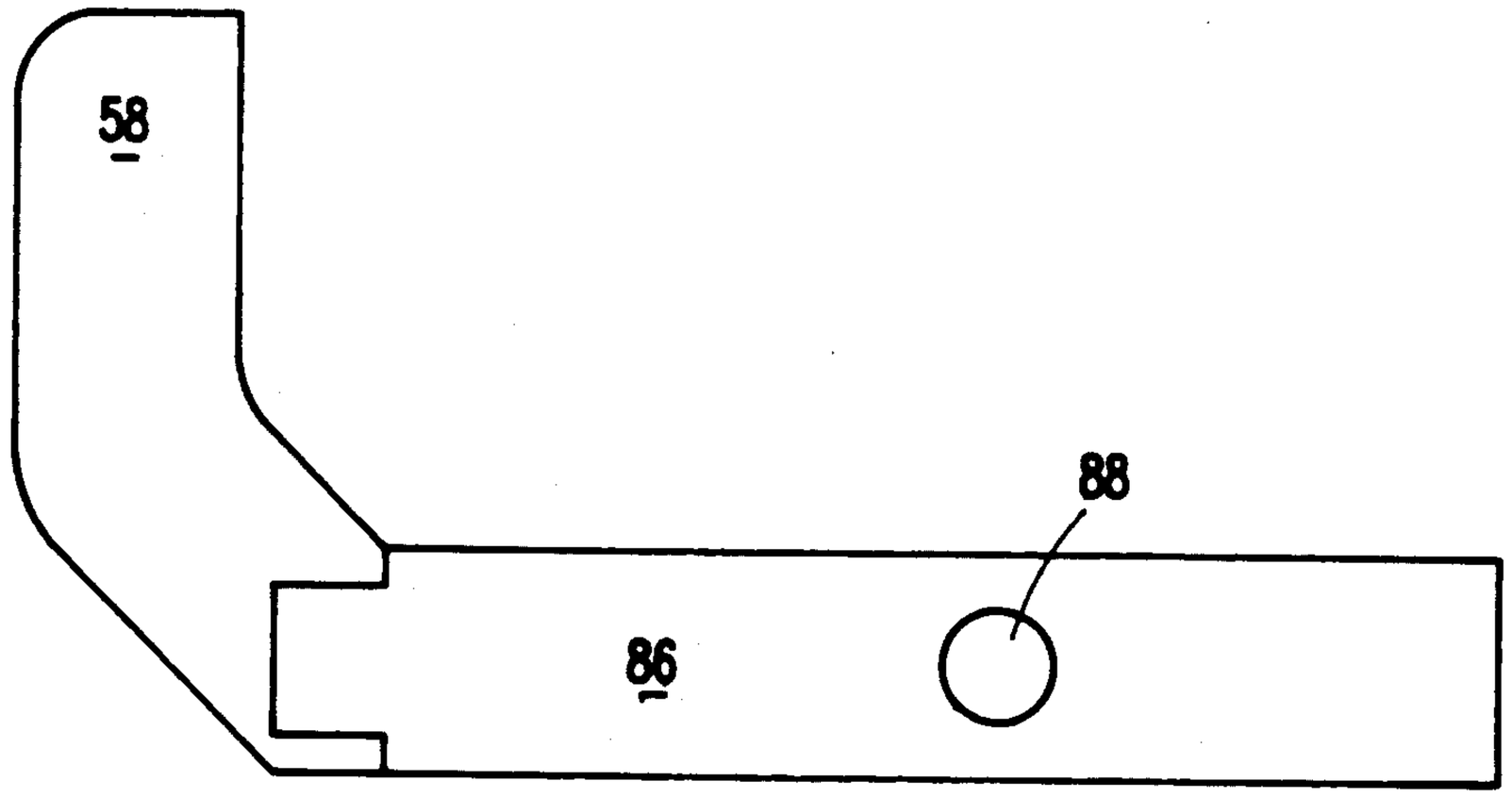


FIG.6

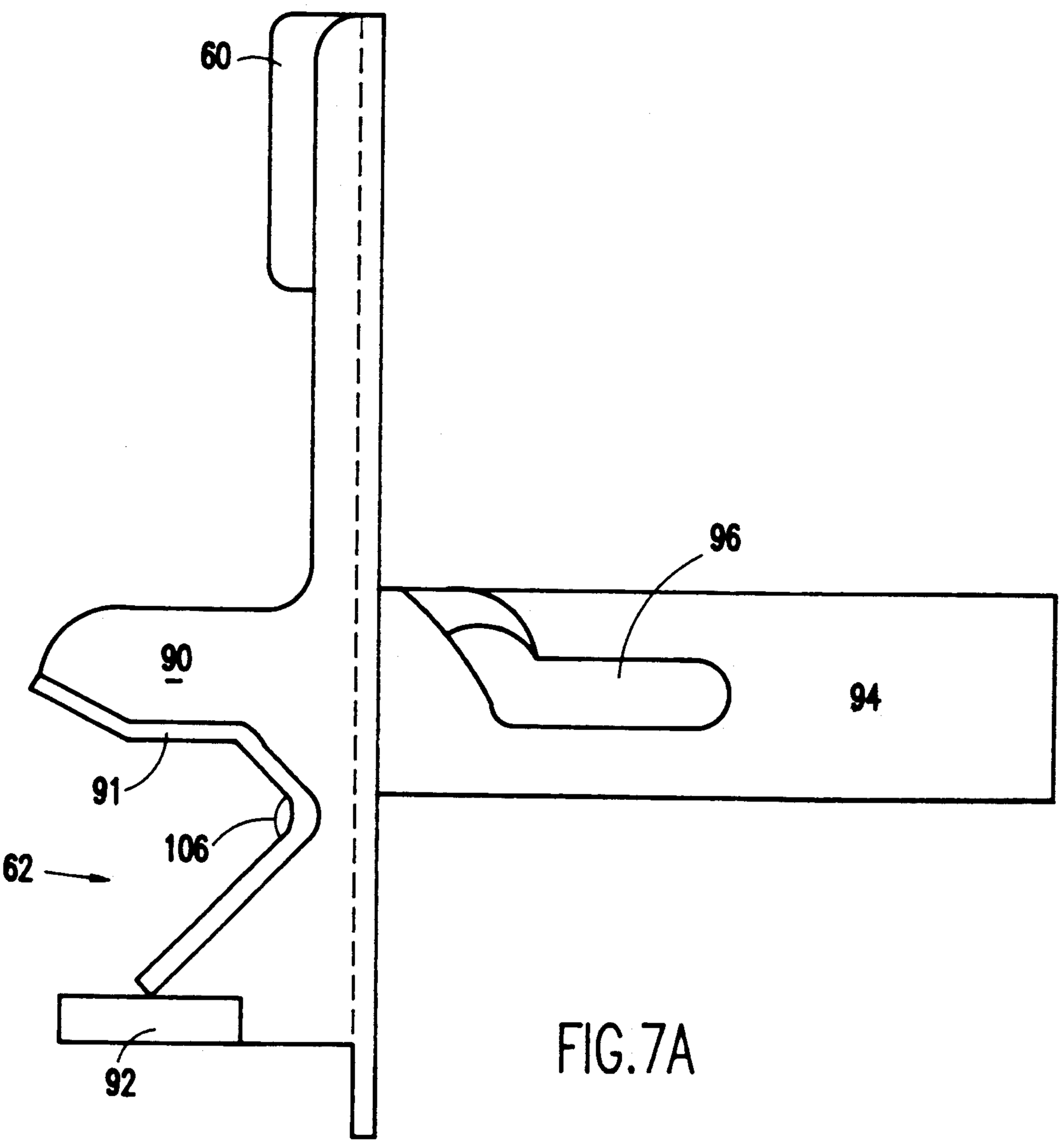


FIG.7A

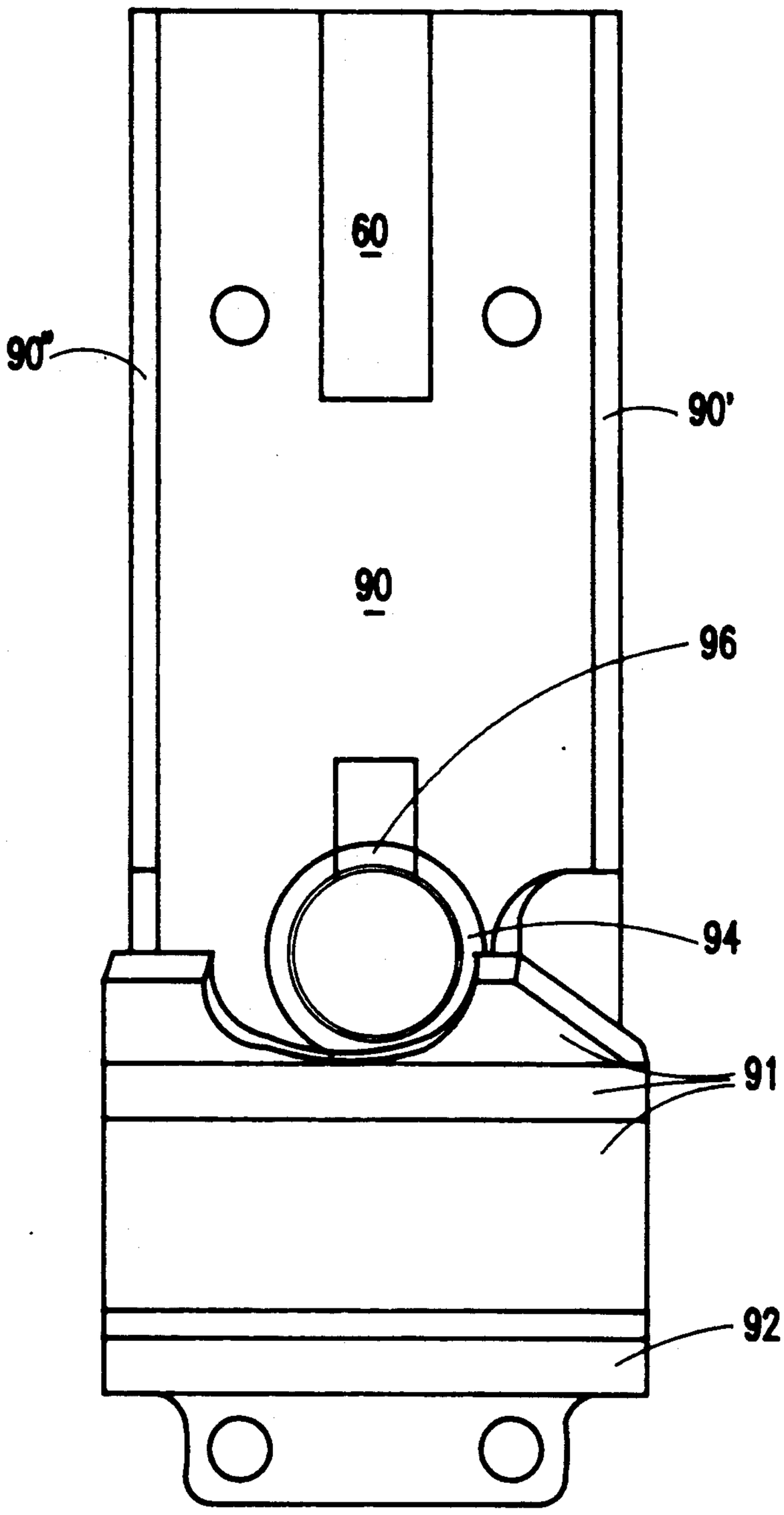


FIG.7B

RAILROAD COUPLER MOUNT

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention is generally related to railroad coupler mounts which secure equipment, such as end-of-train marker light and telemetry equipment, to the coupler head of the last car in a train and, more particularly, to railroad coupler mounts which secure equipment to the guard arm side of a coupler head.

2. Description of the Prior Art

End-of-train signalling and monitoring equipment is commonly used to meet modern railroad operating and safety requirements. Various train operating parameters (e.g., brake line pressure, and the like) are remotely monitored by the end-of-train equipment and telemetered to an engineer in the locomotive cab. In addition, the end-of-train equipment can include a marker light to identify the end of the train.

Over the years, several railroad coupler mount configurations have been devised for securing the end-of-train signalling and monitoring equipment to the coupler head of the last car in a train. U.S. Pat. Nos. 2,355,544 to McGowan and 4,487,060 to Pomeroy show signalling and monitoring equipment positioned inside the coupler head. Positioning the equipment within the coupler head is not ideal since it can be damaged by accidental mating with the coupler of another car, a situation which is likely in an active yard. Moreover, pusher locomotives cannot be connected without first removing the equipment. U.S. Pat. No. 4,592,217 to Fernandez et al. shows mounting the equipment on top of the coupler head by using a flag hole. This arrangement avoids accidental equipment damage; however, the arrangement has the disadvantage that not all coupler heads include a flag hole.

Most railroad couplers used in the United States and Canada are cast with four relief holes, or core holes, in the guard arm side of the coupler head. FIG. **1** shows a typical coupler head **10** used in the United States and Canada with four core holes **12***a–b* and **14***a–b* formed in the guard arm side. The core hole pairs, **12***a–b* and **14***a–b* respectively, are interconnected to provide passages underneath central region **16** and are divided from each other by a rib **18**. The core holes **12***a–b* and **14***a–b* were not originally designed to serve any function on the finished coupler head **10**; rather, they facilitated casting. Nevertheless, the industry has recognized that the coring holes are good locations for securing end-of-train signalling and monitoring equipment and several railroad coupler mounts have been devised which take advantage of them. For example, U.S. Pat. No. 4,520,662 to Schmid shows a coupler mount with four opposing jaw members which grip within the four coring holes **12***a–b* and **14***a–b* in the coupler head **10**. The disadvantage of the Schmid device is that it is heavy and complicated and, therefore, difficult for a single person to install on the coupler head **10**. U.S. Pat. No. 4,691,563 to Martin et al. and U.S. Pat. No. 4,876,885 to Martin et al. each describe railroad coupler mounts which include a banana shaped arm that extends through a core hole pair **12***a–b* or **14***a–b*, respectively. While the Martin et al. devices are easier to mount, there is still a need for alternative railroad coupler mounts which provide easy yet secure installation of the

end-of-train signalling and monitoring equipment on the coupler head of the last car in the train.

SUMMARY OF THE INVENTION

It is therefore an object of the invention to provide a railroad coupler mount which can be secured to the guard arm side of a coupler head using only a single coring hole and the rib located between a pair of coring holes.

According to the invention, a railroad coupler mount includes a single hook which fits within one coring hole of a coupler head, a jaw which is designed to ride on the rib between a pair of coring holes, a pad positioned to bear against the outside surface of the coupler head, and a means to draw the hook against an inside upper lip of the coring hole. The hook can be rotated to a transverse position to allow easy insertion into and removal from the coring hole of the coupler head. In a particular embodiment, a handle used to rotate the hook between its transverse and upright positions serves the additional function of preventing unauthorized access to the battery compartment of the end-of-train signalling and monitoring equipment while it is installed on a coupler head.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other objects, aspects and advantages will be better understood from the following detailed description of a preferred embodiment of the invention with reference to the drawings, in which:

FIG. **1** is an isometric view of a conventional railroad coupler head;

FIG. **2** is cross-sectional side view of a railroad coupler head which illustrates the means for securing the railroad coupler mount to the coupler head according to the present invention;

FIGS. **3**, **4**, and **5** are front, side and top views, respectively, of a preferred end-of-train signalling and monitoring equipment package which includes a railroad coupler mount according to the present invention;

FIG. **6** is an enlarged view of a hook member used in the preferred railroad coupler mount of FIGS. **3** through **5**;

FIGS. **7***a* and **7***b* are enlarged side and front views, respectively, of a mounting bracket member used in the preferred railroad coupler mount of FIGS. **3** through **5**; and

FIG. **8** is a cut-away cross-sectional side view of the bottom portion of the preferred end-of-train signalling and monitoring equipment package illustrating a mechanism for moving the hook member between the transverse and upright positions in the railroad coupler mount.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

Referring now to the drawings, and more particularly to FIG. **2**, the railroad coupler mount includes a hook **20** which fits within core hole **12***a* of the coupler head **10**, a jaw **22** which is relatively wide and rides on the rib **18** that separates core holes **12***a* and **14***a*, and a pad **24** which abuts against the top side wall **26** of the coupler head **10**. When the hook **20** is tightened against the inside upper lip **28** of core hole **12***a*, the pad **24** becomes tightly braced against the top side wall **26** and the jaw **22** becomes tightly engaged with the rib **18** to provide three points of contact with the coupler head **10**, thereby providing a firm grip on the coupler head

10, which resists the severe shaking conditions encountered when a train rolls across several miles of track. A particular advantage of the jaw **22** riding on rib **18** and gripping against both the top and bottom surfaces of the rib **18** is that it is wide enough to prevent rotation of the railroad coupler mount on an axis perpendicular to the mounting face of the coupler head **10**.

A handle **30** is provided to rotate the hook **20** between its upright position shown in FIG. **2** and its transverse position and to tighten the hook **20** against the inside upper lip **28**. The handle **30** can be directly connected to the hook **20** by a threaded member **32** as shown in FIG. **2** or may be connected by a linkage described below in conjunction with FIGS. **6** through **8**. In the transverse position, the hook **20** is more easily inserted into or removed from the coring hole **12***a*. After insertion into the coring hole **12***a*, the hook **20** is first rotated to its upright position and drawn tightly against the inside upper lip **28** using the handle **30**.

While FIG. **2** shows the railroad coupler mount secured to the top front coring hole **12***a* of the coupler head **10**, it should be understood that the railroad coupler mount could easily be secured to the top rear coring hole **12***b* and that the position of the hook **20**, jaw **22** and pad **24** could be changed to allow mounting on the bottom coring holes **14***a* and **14***b*. All that is required to practice the invention is to have a single hook **20** which is insertable into a coring hole and which can be tightened against an inside lip of the coupler head **10**, a jaw **22** which firmly engages the rip **18**, and a pad **24** or other abutting surface so that the railroad coupler mount has three points of contact with the coupler head **10**. End-of-train signaling and monitoring equipment **34** can be positioned above and hose connections **36** for connecting with brake line hoses **38** can be positioned below the railroad coupler mount assembly, and may be integral with or separate from the railroad coupler mount assembly.

FIGS. **3** through **5** illustrate a preferred end-of-train signalling and monitoring equipment package **40** which includes the signalling and monitoring equipment **42**, the railroad coupler mount **44**, and hose connections **46**. The signalling and monitoring equipment **42**, railroad coupler mount **44**, and hose connections **46** can be part of one integral package **40** or be separable in a manner which leaves the railroad coupler mount **44** on the coupler head while the signalling and monitoring equipment **42** is transported elsewhere. The signalling and monitoring equipment **42** includes a radio antenna **48** for telemetering train operating information to an engineer in the locomotive cab, an end-of-train marker light **50**, display **52** for providing train operating information locally to train personnel at the site of attachment of the equipment **42** to the coupler head, and a battery compartment to which access is permitted by a battery door **54**. A carrying handle **56** connected to the signalling and monitoring equipment **42** is provided to allow a single person to transport and install the entire package **40**.

The batteries used in end-of-train signalling and monitoring equipment **42** are long-lasting and generally expensive (e.g., nickel-cadmium or the like), and may be stolen in a railroad yard if easy access is allowed while the signalling and monitoring equipment **42** is installed on a coupler head. Therefore, it is advantageous to provide a locking means to secure the battery compartment door **54**. Since a lock or other retaining device is needed to secure the hook **58** in its upright, lip engaging position while the coupler mount **44** is in use where the pad **60** bears against the outside surface of the coupler head and the jaw **62** engages the rib between the coring holes (see..discussion of FIG. **2**), it has been found advantageous to use the handle **64** to fulfill the dual functions of securing the hook **58** in its upright position and locking the battery compartment door **54**; thereby, only requiring one lock for both functions. As is best shown in FIGS. **3** and **4**, the carrying handle **56** includes a pair of spaced apart tabs **66** and **68** which accommodate a tab **70** on the end of the handle **64**. When the handle **64** has been rotated to its upright position to lock the hook **58** into engagement with the upper lip of the coring hole, the tab **70** is slid between tabs **66** and **68** projecting from the handle **64** and a lock (not shown) is passed through the apertures **72** and **74** in the tabs **66/68** and **70**, respectively. When locked into place, the handle **64** is sufficiently close to latch **76** that it cannot be unlatched; thereby, keeping the battery compartment door **54** locked shut. The battery compartment door **54** is designed so that both batches **76** and **78**, each of which may be of the drawn latch variety, must be unlatched before it can swing open.

FIG. **5** shows that a portion of the bracket **80** used in the coupler mount **44** has a chamfered end **82** on one side while the other side has an extended end **84**. The chamfered end **82** is used to clear core hole obstructions.

FIGS. **6** through **8** illustrate a preferred linkage between the handle **64** and hook **58**. FIG. **6** shows the hook **58** is connected to a tube **86** which has a pin **88** projecting outward from its side. FIG. *7a* shows a bracket **90** that includes on one side the jaw **62** and the pad **60** which are used to engage the coupler head as described above. The jaw **62** is comprised of two spaced apart shaped side walls of bracket **90**, a jaw liner **91** which spans across the of the bracket **90** and fits in the shaped side walls, and a jaw pad **92** which fits underneath the jaw liner **91**. The spacing between the shaped sidewalls of the bracket **90** should be wide enough so that the jaw **62** will aid in resisting rotation on an axis perpendicular to the mounting face of the coupler head. FIG. *7b* illustrates the spacing of the shaped sidewalls **90′** and **90″** of the bracket **90**. With reference back to FIG. *7a*, due to a significant variation in rib width, the jaw **62** has been fashioned with a 90° V-section **106**. It has been determined that a 90° V-section **106** is wide enough to accommodate the thickest ribs, yet the 90° base angle is acute enough to tightly grip the top and bottom surfaces of the rib and prevent rotation about an axis perpendicular to the coupler's mating face. The 90° base angle is obtuse enough that even with wide variations in rib thickness, the ribs will still bottom out in the V-section **106** and not cause excessive tilting of the railroad coupler mount on an axis parallel with the rib. To ensure positive retention, the jaw **62** should protrude as deeply as possible into the core holes of the coupler head on either side of the rib while still avoiding obstructions. Therefore, the top portion of the jaw **62** has been designed such that the shaped bracket **90** can extend deeply into the top core hole while the bottom portion of the jaw **62** includes a jaw pad **92** which extends deeply into the lower core hole. The jaw pad **92** also protects the jaw liner **91** from damage. On the other side of the bracket **90**, a jack tube **94** with a guide slot **96** has been provided. FIG. **8** shows that the jack tube **94** and guide slot **96** cooperate with the outwardly

extending pin **88** on the tube **86** connected to the hook **58**.

With particular reference to FIG. **8**, the hook **58** is rotated and drawn inward or moved outward relative to the pad **60** by rotating the handle **64**. The handle **64** is connected to a screw **98** via a pin **104**. The screw **98** passes through the Belleville washer stack **102** and nut **100**, and is retained in nut **100** by retaining ring **103**. Nut **100** extends into jack tube **94** and provides a firm base for screw **98** to bear against. The screw **98** is connected to threads in the rear opening of tube **86**.

As the handle **64** is rotated, the screw **98** causes the tube **86** to be drawn inward or moved outward, thereby moving the hook **58** toward or away from the vicinity of the pad **60**. The jack tube **94** bears all the compressive load of the screw **98** so that the enclosure walls **106** and **108** are free of stress. This is accomplished by the screw **98** bearing against the nut **100** and belleville washer stack **102** which, in turn, transmits the screw load to the jack tube **94**. The handle **64** does not directly rotate the hook **58**; rather, hook rotation is accomplished by the pin **88** of tube **86** riding in the slot **96** of the jack tube **94**. As the screw **98** moves the tube **86** inward, the pin **88** slides down the slot **96** in the jack tube **94** and rotates the hook **58** from a transverse position to an upright position in the initial travel of the hook **58**. As is indicated by the dashed outline of the pin **88'**, the enclosure wall **106** prevents the hook **58** and tube **86** assembly from being accidentally ejected from the railroad coupler mount **44** after it has been rotated to its transverse and fully extended position because the pin **88** will abut against the enclosure wall **106** and will prevent the screw **98** from forcing the tube **86** any more forward. It should be understood that the screw **98** is but one of many devices which could be used to move the hook **58** and tube **86** inward and outward, and that other devices including a pneumatic tightener, or the like, could also be used within the practice of the invention.

While the invention has been described in terms of its preferred embodiments, those skilled in the art will recognize that the invention can be practiced with modification within the spirit and scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is as follows:

1. A railroad coupler mount assembly, comprising:

a railroad coupler mount;

a jaw member, connected to said railroad coupler mount, for engaging a rib between a pair of coring holes in a railroad coupler head;

a hook, connected to said railroad coupler mount, for insertion into one of said pair of coring holes, said hook being rotatable between a non-engagement position which allows easy insertion into and removal from said one of said pair of coring holes and an engagement position where said hook is oriented to contact an inside surface of said one of said pair of coring holes;

an abutting member, connected to said railroad coupler mount, for bearing against an inside surface of said railroad coupler head;

means to rotate said hook between said nonengagement and engagement positions; and

means for tightening said hook against said inside surface of said one of said pair of coring holes so that said railroad coupler head is firmly held by said hook, said abutting member, and said jaw member.

2. A railroad coupler mount assembly as recited in claim **1** wherein said means for tightening comprises a handle and a screw rotatable by said handle, said screw being connected to said hook so that rotation of said screw translates said hook alternatively toward and away from said jaw member and said abutting member.

3. A railroad coupler mount assembly as recited in claim **2** wherein said screw is connected to said hook by a tubular connecting member and wherein said means to rotate said hook between said non-engagement and engagement positions includes a jack tube encircling said tubular connecting member, said tubular connecting member having a means for cooperating with a slot in said jack tube, said slot in said jack tube being arranged so that said means for cooperating turns said tubular connecting member as said screw is rotated which in turn rotates said hook between said non-engagement and engagement positions.

4. A railroad coupler mount assembly as recited in claim **1** wherein said jaw member has portions which extend to each of said pair of coring holes.

5. A railroad coupler mount assembly as recited in claim **1** wherein said jaw member has a V-shaped base of up to ninety degrees which abuts against said rib.

6. An end-of-train signalling and monitoring equipment package comprising:

a railroad coupler mount assembly which includes

(i) a railroad coupler mount;

(ii) a jaw member, connected to said railroad coupler mount, for engaging a rib between a pair of coring holes in a railroad coupler head,

(iii) a hook, connected to said railroad coupler mount, for insertion into one of said pair of coring holes, said hook being rotatable between a non-engagement position which allows easy insertion into and removal from said one of said pair of coring holes and an engagement position where a cantilevered portion of said hook is oriented to contact an inside surface of said one of said pair of coring holes,

(iv) an abutting member, connected to said railroad coupler mount, for bearing against an outside surface of said railroad coupler head,

(v) means to rotate said hook between said non-engagement and engagement positions, and

(vi) a handle and a screw for tightening said hook against said inside surface of said one of said pair of coring holes so that said railroad coupler head is firmly held by said hook, said abutting member, and said jaw member, said handle capable of rotating said screw and said screw being connected to said hook so that rotation of said screw translates said hook alternatively toward and away from said jaw member and said abutting member; and battery powered end-of-train signalling and monitoring equipment connected to said railroad coupler mount, said battery powered end-of-train signalling and monitoring equipment including a battery compartment door which is shut closed by latch members, said handle of said railroad coupler mount being lockable in a position which prevents one of said latch members from being unlatched, thereby preventing unauthorized access to a battery in said battery powered end-of-train signalling and monitoring equipment.

* * * * *